

- b. O. postorbitale produced over the superciliary region..... Achrochordidæ.*
 bb. Postorbitale forming the hinder border of the orbit only. The families of this group have not yet been defined.
- V. O. maxillare horizontal, thickened, and not reaching premaxillare anteriorly, in contact with prefrontale, bearing a perforate and usually grooved tooth PROTEROGLYPHA.
 α. Caudal hypapophyses bifid. Neural spines and pleurapophyses short.
 Postorbitals wanting; no splenio-mental groove..... Elapidæ.
 Postorbitals present..... Najidæ.
 β. Caudal hypapophyses simple.
 Neural spines and pleurapophyses elongate. A post-frontal bone..... Hydrophidæ.
- VI. O. maxillare vertical, attached to prefontale by a ginglymus, and to the ectopterygoid without imbrication. Fang very seldom grooved..... SOLENOGLYPHA.
 Embracing the families Atractaspidæ, Causidæ, Viperidæ and Crotalidæ. For characters vid. Pr. A. N. Sci., 1859, 334.

On a Blind SILURID, from Pennsylvania.

BY E. D. COPE.

Animals deprived of the sense of sight are generally known inhabitants of subterranean areas of earth or water, although representing by their general structure, zoological groups most diverse. Among fish, two blind species of the Cod family are found in the caves of Cuba. The blind fish of the Mammoth Cave, with its sightless relative, the Typhlichthys, belong to a family represented by an eyed genus in the ditches of Carolina. Among the Catfish or Siluridæ there are sundry genera of a variety of form, in which the eyes are wanting or concealed by the skin. These are mostly South American or East Indian species, those of the latter country, of the Akysis type, approach nearest to our eyed Catfish of North America, according to the system of Bleeker. For a knowledge of the first genus of blind Silurid from our country, I am indebted to my friend Jacob Stauffer, Secretary of the Linnæan Society of Lancaster, an ardent explorer of the Zoology and Botany of Southern Pennsylvania, and who has furnished me with many valuable notes and specimens. This fish, of which specimens have been taken in the Conestoga creek, a tributary of the Susquehannah, is simply a blind representative of the ordinary type of Silurids, characteristic of North America, and is not to be arranged with the exotic groups. It, therefore, enters the group *Ictaluri*, of Gill, with our genera *Ameiurus*, *Hopladelus*, *Noturus* and *Ictalurus*, possessing especially the characters of the first. The genus may be called *Gronias*, and be explained by the following diagnosis:—Head broad, depressed. Supraoccipital bone posteriorly free. Branchiostegal membrane with ten rays. Anterior dorsal spine stout, posterior fin separated from caudal. Ventrals with eight rays. Eyes rudimental, covered by the corium. Natatory bladder present.

The species has the head broader posteriorly, and the anal fin shorter than in the allied species of *Ameiurus*. It may be called *G. nigrilabris*. The muzzle is flat and the jaws equal; the width across the occipital region is equal to the length from the end of the muzzle to the apex of the occipital crest; width below equal from the axilla of the pectoral to the base of the ventral fin. From end of muzzle to dorsal spine equal from latter to middle of adipose. Length of head four and one-fifth times in total length. Max-

* Vid. Pr. A. N. S., 1860, 75.

illary barbels extend three-fourths the distance to the opercular border; outer (longer) mentals scarcely beyond middle branchiostegal angle. Height of body at base of dorsal equal three-fourths length of head. End of pectoral opposite posterior border of first dorsal, its spinous ray serrate; ventrals not reaching anal. Basis of anal terminating a little behind base of adipose; length of caudal peduncle below, equal length of pectoral spine. Rays D. 1-7; P. 1-9; V. 8; A. 18; C. 16. Spine of dorsal smooth. Caudal openly emarginate, the emargination much above the middle rays, giving the highest a short lobate outline. Lateral line straight to scapular angle, mouth of axillary mucous duct distinct. Length of head 2 in. 8 l.; width below 2 in. 2 l.; from muzzle to base of ventrals 4 in. 3 l.; to base of caudal 7 in. 9 l.; length of caudal 1 in. 7 l.; another specimen is about ten inches in length. The color of the upper surfaces, tail, fins, barbels and under jaw is black; sides varied with dirty yellow, abdomen and thorax yellowish-white. J. Stauffer informs me that the dark pigment of the skin of this animal comes off upon the hands in handling it. A specimen died in twenty minutes after capture, when put in water, though uninjured; the Ameüri, like other Catfish, will live for many hours after complete removal from their element. It is occasionally caught by fishermen, and is supposed to issue from a subterranean stream, said to traverse the Silurian limestone in that part of Lancaster county, and discharge into the Conestoga.

Two specimens of this fish present an interesting condition of the rudimental eyes. On the left side of both a small perforation exists in the corium, which is closed by the epidermis, representing a rudimental cornea; on the other the corium is complete. Here the eyeball exists as a very small cartilaginous sphere with thick walls, concealed by the muscles and fibrous tissue attached, and filled by a minute nucleus of pigment. On the other the sphere is larger and thinner walled, the thinnest portion adherent to the corneal spot above mentioned; there is a lining of pigment. It is scarcely collapsed in one, in the other so closely as to give a tripod section. Here we have an interesting transitional condition in one and the same animal, with regard to a peculiarity which has at the same time physiological and systematic significance, and is one of the comparatively few cases where the physiological appropriateness of a generic modification can be demonstrated. It is therefore not subject to the difficulty under which the advocates of natural selection labor, when necessitated to explain a structure as being a step in the advance towards, or in the recession from, any *unknown* modification needful to the existence of the species. In the present case observation on the species in a state of nature may furnish interesting results. In no specimen has a trace of anything representing the lens been found.

I am indebted to the same enterprising Society and its Secretary for another inhabitant of the Conestoga, which has hitherto escaped the notice of zoologists. This species, which has been distinguished by Jacob Stauffer in correspondence, is an *Etheostoma*,* one possessing the character of the genus in a

* A species of the allied genus *Peciliichthys* in the Mus. Academy Nat. Sci., from the Platte River, near Fort Kearney, Nebraska, presented by Dr. Hammond, appears to have been as yet undescribed. It may be called *P. mesæus*. A stout, little compressed species, with large scales. Dorsals not in contact. Eye entering five times into length of head, more than once in muzzle anterior to its border; head $4\frac{1}{4}$ times in total length. Caudal very rounded; first scarcely as

high as second dorsal. Pectorals longer than ventrals, not reaching vent. Scales 40. Fin rays

D. ix-13; P. 10; V. 1-4; A. 9; C. 2-14-1. Outline of back rather elevated. Length $2\frac{1}{4}$ inches. Beside the large size of the scales, the proportionally longer head and four soft ventral rays distinguish it from other species. The color in spirits is pale brown, with four dorsal blotches, and a few groups of zigzags on the sides. Second dorsal and caudal barred.

The collections also contain a series of species of *Hololepis*, which differ as follows, one being apparently undescribed:

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higher degree than does the best known type, the *E. blennioides*. This is, especially, the existence of a median abdominal series of thick shield-like scales, with short mucrones radiating from the free margins. In the type of the genus these scales are little larger than those of the ordinary form; in the present species they are four times the size of the largest on the body. The following description will express the general characters:—*Etheostoma peltatum* Stauffer; body and head more compressed and elevated, and the muzzle longer than in *E. blennioides*. Four times the length of the head (from below the opercular spine) extends a little beyond the base of the caudal fin, commencing at the end of the muzzle. Pectoral as long as head, and a little less than equal base of first dorsal. Greatest height equal from end of maxillary to edge of operculum. Eye $3\frac{1}{2}$ times into length of head, measured to below opercular spine. Breadth of body through scapular re-

7

gion much greater than elsewhere. Scales 53, two rows on each side the

9

lateral line longest. No scales in front of the first dorsal or on the head, except a very few on the operculum. A shield in the clavicular angle, one between the ventral fins, and six in a series commencing opposite the middle of the ventrals, and extending to vent; the last double. Dorsal fins well separated xiii—13. Caudal deeply lunate 17; A. 11; V. 6; P. 14. Total length three inches. All the fins are finely barred, the ventrals but little, except the first dorsal, where a series of lunate black spots occupies the middle of the interradial membrane. The dorsal region is bright olive, with a series of short brown cross-bars. The lateral region is occupied by a longitudinal series of broad brownish shades; between these and on the belly and jaws orange and yellow. From spinous dorsal to occiput; from hinder frontal region to end of muzzle extending round front of orbits; a broad perpendicular bar from orbit downwards, and blotch on the operculum—black.

Jacob Stauffer informs me that its movements are quick and lively, and that it presents a striking appearance in its native waters.

Lateral line to middle of first dorsal, on about 12 scales.

2

Head $3\frac{1}{4}$ times in total length. D. viii—9; A. 9. Scales 52.

9

fusiformis.

3

Lateral line on 12—16 scales, to middle of first dorsal. Scales 42—4

7

erchrous.

Head four times in total length. Rays D. ix—10; A. 9.

2

Lateral line on 23—8 scales to origin of second dorsal. Scales 56

8

barrattii.

Head four times in total length. Rays D. x, xi—10, 11; A. 9.

Holelepis erchrous is found in streams and dams, particularly near Brown's Mill in the eastern part of New Jersey, opposite Philadelphia. Its length is about two inches. The eye enters the length of the head five times, from end of muzzle to edge of orbit being one diameter of eye. Pectoral and ventral fins equal; rays of latter 1—5. A broad blackish band extends from the end of the muzzle to base of tail, covering one-third the height laterally and interrupted by reddish-yellow punctulations. Above the band pulverulent with reddish and rufous shades; below pale yellow in spirits, rarely with specks; color similar on the head below the band, except a vertical black streak below the eye. This very pretty fish was found, and specimens presented to me, by my friend Jesse Burk, of this city.

1864.]